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THE PLANT DISEASE BULLETIN

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THE PLANT DISEASE SURVEY

VOLUME IV NUMBER 2

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BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE PLANT DISEASE BULLETIN

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THE PLANT DISEASE SURVEY

Vol. IV Number 2

POTATO WART SURVEY

The search for new occurrences of potato wart has commenced again this year and already a new location for the disease has been found. The party of men in charge of Mr. W. L. Garis, working out from Saxton, Pennsylvania discovered wart in Woodvale, Huntingdon County, July 28. This town is about fifteen miles southeast from Saxton and is in the heart of a mining region. It is about thirty-five miles from any other place where wart is known to occur. We have been notified of only one infested garden but in this the disease was prevalent in all parts. The soil has apparently been infested for some time as the same seed planted in other gardens showed none of the disease. This report of occurrence has been checked by specimens, and the quarantine officials at Washington and at Harrisburg, Pennsylvania have been notified.

At the present time (July 31) there is a party of five men working in Pennsylvania. Professor A. A. Farnham is advance agent for the group and precedes the main party, making the necessary preliminary contacts, and provides a certain amount of publicity so that when the survey men arrive they can commence work immediately, and can proceed with fewer difficulties. The scouting party in Pennsylvania includes W. L. Garis, leader, J. C. Dunegan, A. L. Mitke, and Michael Skweir. In West Virginia a similar group of men are working. Dr. A. F. Hemenway is advance agent and Professor H. S. Stahl, leader. W. W. George, J. E. Haifleigh, A. W. Harman, and J. H. Mullen constitute the rest of the party.

All the men are doing intensive survey work reaching out from the known areas of infestation in an ever widening circle. By the end of this season the present known areas should be quite well delimited and a considerable amount of ground outside of these covered.

In addition to the intensive work in West Virginia and Pennsylvania, the Federal Horticultural Board desires a large number of gardens inspected in certain other suspicious and somewhat comparable places. The services of the following men have been secured to do intensive work outside of Pennsylvania and West Virginia: Dr. L. R. Hesler, Professor H. C. Young, Mr. George Haines, and Dr. G. W. Martin. It is planned to inspect gardens on the outskirts of New York City and also in certain other towns and villages in New York State. Places where the foreign population is rather heavy will also be visited in Connecticut and Massachusetts, and certain fishing villages on the coast north of Boston will need examination. A few representative coal mining regions in Maryland, Ohio, Indiana and Illinois will probably be visited by some of these men.

VEGETABLES AND FIELD CROPS

BEAN

Bacterial blight caused by Bacterium phaseoli

Reports of the occurrence of baterial blight were received July 1 from New Jersey (on seedlings), Virginia (slight at Blacksburg), Wisconsin, Kentucky, Tennessee, Mississippi, Louisiana, Texas and Arkansas. These reports indicate that while the disease is common in most states, it is not severe except in a few fields. Louisiana reported the loss due to blight as probably less than usual.

Kentucky: (Valleau, July 1) Present in most gardens but causing very little damage as it is not spreading.

Tennessee: (Hesler, July 1) General in state. One field heavily injured at Jackson, western Tennessee. Chiefly leaf infection with slight amount on pods.

Mississippi: (Neal, July 1) Common throughout the state, but only in a very few instances has it been found or reported to cause appreciable loss.

Anthracnose caused by Colletotrichum lindemuthianum

Anthracnose was reported July 1 from New Hampshire, Virginia (slight at Blacksburg), Alabama, Mississippi, Louisiana, Texas, Arkansas and Wisconsin. Infected beans said to have come from Florida were found on the market in Knoxville, Tennessee.

Except in New Hampshire, where it is said to be doing considerable damage in some counties, the disease, although common, does not seem to be serious as yet.

Mississippi: (Neal, July 1) Anthracnose infection was observed at Crystal Springs, Hazelhurst, and also in hampers at depot at Jackson, during May. The infection in the field at either place was not over 1-2%. All of the infection observed was on the wax varieties; the green beans being free of the disease.

Mosaic (cause undetermined)

Virginia: (Fromme, July 1) Slight at Blacksburg on garden beans, also on English broad bean.

Tennessee: (Hesler, July 1) Moderate cases observed at Humboldt in western part of state June 15, and traces noted at Knoxville (eastern Tennessee).

Georgia: (McClintock, July 1) Small per cent observed on string or snap beans to date, but none seen on pole beans as yet this season.

Michigan: (Coons, July 1) Not seen in field beans as yet. Case of 26% infestation in a garden patch of wax beans seen at Kalamazoo.

Mississippi: (Neal, July 1) This disease is present in many localities in the state. I observed many fields at Crystal Springs affected with

the disease, some fields appeared to have fully 10-12% of the plants infected. I have also observed the disease in the gardens around Starkville. Appears to be worse on wax varieties.

Louisiana: (Edgerton, July 15) Very common, even in fields producing a satisfactory crop. No way of estimating loss.

Arkansas: (Elliott, July 1) Common.

Wisconsin: (Vaughan, July 15) Small amount seen. Little if any damage.

Oregon: (Barss, July 1) Incomplete observations indicate the occurrence of this disease in high percentages in many fields in the vicinity of Corvallis. Further survey is expected to establish its widespread occurrence.

Rust caused by Uromyces appendiculatus

Rust was reported from Texas and Arkansas as unimportant, and from Louisiana and New Mexico as follows:

Louisiana: (Edgerton, July 15) Common on some varieties. This disease is usually the most troublesome in the summer months on the pole varieties.

New Mexico: (Leonian, July 1) Abundant in southeastern part of the state. Other sections comparatively free from it.

Stem rot caused by various organisms

Stem rot is reported from New Jersey, Kentucky, Louisiana, Texas and Michigan. In no case is it said to be important. In New Jersey the cause has been given as Rhizoctonia, and in Texas as Sclerotium rolfsii.

Diaporthe phaseolorum (leaf spot stage) is reported as very abundant on lima beans in the southern part of New Jersey.

CABBAGE

Yellows caused by Fusarium conglutinans

Yellows was reported July 1 as present, apparently in the normal amounts, in Delaware, Maryland, Virginia, Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Oklahoma (one report) and Arkansas. According to the Weekly Crop Notes of the Bureau of Crop Estimates the disease is causing some damage to the cabbage crop in the Muscatine district in Iowa (July 8).

Delaware: (Manns, July 1) Specimens brought in today (June 24). Quite severe in some fields, 10% dying.

Virginia: (Fromme, July 1) Moderate to severe in fields near Marion, Smyth County.

Kentucky: (Valleau, July 1) Reported from Hopkinsville and Farmington, causing considerable losses in small plantings. Observed in Louisville.

District causing loss of 30-75% in early cabbage. It is apparently the most serious cabbage disease at present.

Tennessee: (Hesler, July 1) Definite in Henderson, Scott and Davidson Counties. Probably not generally serious this year.

Alabama: (Thiel, July 1) In small amounts in nearly every field in the Mobile section.

Mississippi: (Neal, July 1) Yellows appears to be rather general around the Crystal Springs section, but apparently causing as yet but little loss.

Louisiana: (Edgerton, July 15) Very common. Loss heavy the past season.

Arkansas: (Elliott, July 1) Common and severe.

Black leg caused by Phoma lingam

Black leg was reported July 1 from New Jersey (on seedlings), Maryland, Georgia, Alabama, Mississippi, Louisiana and Arkansas. Judging from the reports at hand it apparently is causing little damage on cabbage except in Maryland, Alabama and Arkansas.

Georgia: (McClintock, July 1) Not observed to any great extent on cabbage, but serious in collards grown for seed. 75% of the plants were killed during the season, due to Phoma attacks on the stem. Suspected of being seed carried by collards.

Alabama: (Thiel, July 1) Very prevalent and serious in the vicinity of Mobile. Present in nearly every section of the state.

Mississippi: (Neal, July 1) The disease does not seem to be so prevalent as last year, and only a few fields were found with it in the vicinity of Crystal Springs this season.

Black rot caused by Bacterium campestre

Black rot is said to be unimportant in New Jersey and Texas, and to be causing some damage in parts of Alabama and Mississippi, as shown in the following reports:

Alabama: (Thiel, July 1) Very serious in the Mobile section. From 5-25% of the plants in several fields in Mobile County were affected.

Mississippi: (Neal, July 1) Black-rot was observed in many fields at Crystal Springs, Utica, Hazelhurst, and Gulfport the latter part of May and June. In some fields the infection ranged from 2-5%, and one field near Crystal Springs was observed which had as high as 10% black-rot infection.

Black leaf spot caused by Alternaria brassicae

Black leaf spot was reported July 1 only from Mississippi, where a few fields in the vicinity of Crystal Springs were infected from 2-3%. G. K. K. Link reported in March that dry weather restricted the appearance of Alternaria in the Colma and Watsonville sections of California.

Ring spot caused by Mycosphaerella brassicicola

Ring spot was reported in March by G. K. K. Link from the Colma district of California, as follows:

"The excessively dry weather has practically kept ring spot of cabbage, brussels sprouts, and cauliflower in check in the early crop of the Colma district. The younger plants, however, show a very considerable infection with consequent yellowing and death of the leaves, and therefore may produce small heads of poor shipping quality even though rains should set in. Ring spot seems to be restricted to the northern sections of the state. It has not been reported south of the Colma district."

Rot caused by Sclerotinia libertiana

Rot was reported (March) from California by G. K. K. Link. It was said to have been found in all trucking districts of the state except those of the Coachella and Imperial Valleys. The heavy fogs prevailing in those sections and the cool weather of the winter and spring months are especially favorable to the disease.

Slimy soft rot caused by Bacillus carotovorus

Slimy soft rot was abundant and caused considerable loss in the field in Louisiana (July 15). It was present in shipments from Alabama, affecting from 50-75% of the contents of several cars.

Black leaf speck was reported by G. K. K. Link as present in California in practically all sections visited where the variety Winningstadt was grown. (March)

Malnutrition. Unfavorable soil conditions, improper cultural methods, and unfavorable weather were largely responsible for the general poor conditions of cattage in California, according to a report of G. K. K. Link. (March)

CELERY

Late blight caused by Septoria petroselini apii

Late blight was reported from California in March by G. K. K. Link as follows:

"Celery in the Sacramento, Watsonville, and El Monte districts was severely affected with late blight. Most of the fields in the El Monte section are badly stunted and yellow. This condition is supposed to be due to 'cold weather' and 'frosts'. In most fields severe petiole lesions were found and numerous plants were found in the field that were going down with slimy soft rot following late blight. Spraying is practised in the El Monte district, but if it is not done more intelligently very soon the El Monte celery industry will become a thing of the past. Spraying is begun too late and too much reliance is put in the plants 'growing away from it' (the blight). Seed beds

are prepared in fields from which blighted celery was harvested, in fact, I noted a seed bed full of trash of the blighted celery crop harvested a week or so previous to the preparation of the seed bed. It is not surprising therefore that some California celery arrives in the market badly blighted and slimy".

Foot rot caused by Sclerotinia libertiana

Foot rot was reported by I. C. Jagger in February as occurring in practically all fields in the vicinity of Sanford, Florida. The disease was also reported from California (March) by G. K. K. Link, in the Sacramento, Watsonville, and El Monte districts. At the latter places it was particularly prevalent, in some fields affecting 25% of the plants, and causing a typical drop. The disease is favored by the cool weather and heavy fogs prevailing in those sections and also by the dirt bank method of blanching used.

Watery soft rot caused by Sclerotinia libertiana was prevalent and often quite destructive in celery shipped from New York (2 cars), Florida (90 cars), Michigan (1 car), and California (37 cars).

Gray mold rot caused by Botrytis sp. was reported by G. K. K. Link in March from California as common in most of the trucking sections visited.

LETTUCE

Downy mildew caused by Bremia lactucae

Downy mildew was common and favored by weather conditions in most of the trucking sections of California, according to G. K. K. Link (March). It is said to be responsible for most of the transit troubles in lettuce shipped from Los Angeles and points north.

Inspectors of the Bureau of Markets have found downy mildew in 19 cars of lettuce shipped from California this year. In most cars from 50-100% of the heads showed decay, which was bad in some cases, although usually only the outer leaves were so affected.

Watery soft rot caused by Sclerotinia libertiana

Watery soft rot was serious in February in the vicinity of Sanford, Florida, according to I. C. Jagger. It was also reported by G. K. K. Link in March from California, where it was common in the fields in most of the trucking districts.

The disease has been reported in shipments of lettuce from several states, as follows: South Carolina, one car with considerable decay; Florida, 15 cars, decay slight to severe; Minnesota, one car, decay considerable; Texas, 8 cars, decay slight to severe; Arizona, 6 cars, decay considerable; California, 29 cars, decay slight to severe.

Gray mold rot caused by Botrytis sp. was reported from California by G. K. K. Link in March. The disease was common in most of the trucking sections visited. At Watsonville three fields were observed in which 20% of the plants were affected.

GREEN PEAS

The greatest loss to Maryland pea canners this year according to C. E. Temple has been due to seed of mixed varieties. The seed in a number of cases was bought for good Alaska stock but whole fields will average four feet to six feet in height with few or no peas produced. In every case investigated the seed is supposed to have come from Washington and Idaho. If any other person has further information on this subject Professor Temple and the Plant Disease Survey would be glad to receive it.

Root rot, probably caused by Fusarium, Pythium, and possibly other organisms.

Root rot is common again this year in the tri-state area including New Jersey, Delaware, and Maryland. Reports would indicate, however, that it was not nearly so severe as last year when peas were very severely injured. The pea crop in Delaware is said to be the largest in the last six to eight years. In Connecticut root rot is extremely serious this year. This is the first season the disease has been noticed to any great extent. It is very prevalent, being present in practically every patch of peas about New Haven, and is reducing the yield one-half or more. The plants became yellow at about the time when the pods were filling and when pulled showed a decayed root system and darkened lower stem.

The following state reports have been received:

New Jersey: (Cook, July 1) Abundant.
Delaware: (Le Cato, May 14) Found first fields with pea root rot yesterday.
(Manns, July 1) Specimens with Pythium brought in by Dr. F. R. Jones. Pea crop largest in years.
Maryland: (Temple, July 1) Fusarium associated with Pythium present in almost all fields. Most prevalent in fields planted to peas several years in succession. In some cases as much as 50% of the crop is lost through this trouble.
Virginia: (Fromme, July 1) About 5% of plants in gardens at Blacksburg affected.

Blight caused by Ascochyta pisi

Blight has been reported from Massachusetts, Delaware and Maryland. In the latter state it was observed causing a considerable loss in a few fields.

Spot caused by Septoria pisi is reported from Delaware and Maryland but is not causing much of any loss.

POTATO

Late blight caused by Phytophthora infestans

Late blight has been reported to the Survey this year from Florida, Alabama, South Carolina, West Virginia, New York and Wisconsin. Recent information to show how badly the Florida crop was affected is not at hand but it is thought to have been somewhat subnormal this year. It was first reported March 22 in Florida. Mr. Shapovalov reported the disease as rather prevalent in the Charlestown, South Carolina section in early June. The occurrence in New York was at Orient, Long Island and was noted by F. C. Meier early in July. The disease in West Virginia was reported on by Anthony Berg as follows:

"It may perhaps be of interest to you to know that I have located a potato field near Winfield, West Virginia, infected with late blight. The disease was already well established on June 27."

In Wisconsin, J. W. Brann has just reported finding a slight infection on Green Mountains in Oneida County, June 25.

Mosaic (cause unknown)

Alabama: (Thiel, July 1) Very common in Mobile County. From 50-90% of the plants in six different fields in Mobile County were affected. This seed was received from certified stock of Wisconsin. Fields which showed a heavy infection in May recovered considerably and the loss due to this disease was negligible. Triumph variety was always heavily diseased.

Georgia: (McClintock, July 1) Observed on Triumph and Green Mountain, but causing most serious losses on the former. None observed on Cobbler, Early Rose, or Early Ohio growing in the same field with the above.

Leaf trouble caused by a number of factors.

New York: (News Notes of the Office of Cotton, Truck and Forage Crop Disease Investigations, July 24) Mr. M. Shapovalov returned on July 13 from a short trip to Riverhead, L. I., to investigate a potato leaf trouble reported there. The condition was not found to be as serious as reported but was of considerable interest. The symptoms of the trouble were found to be, first a bronzing, then irregular spotting, and finally complete death of the leaves. A careful inspection led to the belief that it was caused by lack of nitrogen, coupled with mosaic and aggravated by insects and early blight.

Fusarium wilt caused by Fusarium oxysporum

Fusarium wilt is reported from Colorado by H. G. MacMillan (July 10), as follows:

"Potato seed piece rot (Fusarium) has been delayed somewhat but is coming on now. With the plants as well established as they are I do not look

for any epidemic of blight (Fusarium) this year. In fact, the crop looks better, even though it is late, than I ever saw it before at this time of the year. In the dry lands, where some seed stock is being propagated for the irrigated district, the potatoes are not so well along."

TOMATO

Leaf spot caused by Septoria lycopersici

It is rather early for reports of this disease, but it has been observed in a number of the southern states including Georgia, Mississippi, and Missouri. Prof. D. C. Neal, of the Mississippi Experiment Station, reported having observed slight damage in the vicinity of Crystal Springs and in Lauderdale County.

Fusarium wilt caused by Fusarium lycopersici

This wilt is prevalent as usual and is doing a great deal of damage at the present time in some of the more southern tomato states. The following reports from Georgia, Alabama, and Mississippi indicate the situation more clearly:

Georgia: (McClintock, July 15) Has already killed 10-25% of the tomatoes from commercial seed planted in various sections of the state. Resistant selections are holding up well to date, two pickings having been made.

Alabama: (Thiel, July 15) Inquiries indicate the disease quite common throughout the state.

Mississippi: (Neal, July 15) With the exception of blossom-end rot this disease is responsible for greater tomato losses than all the others combined. It is prevalent again this year all over the state. The wilt resistant strains sent out by the Office of Cotton and Truck Disease Investigations have been found to be effective in controlling the disease in many instances, but commercial growers are still employing susceptible varieties.

Early blight and nailhead spot caused by Macrosporium solani

This disease was common again in Florida, and the report from Mississippi indicates that it was prevalent as usual, but the losses were not sufficient to warrant spraying.

McClintock in Georgia states that on July 15 the disease had not come to his attention, and Thiel in Alabama says that only a few reports have been received from different sections of the state.

On tomatoes shipped from Florida during the spring and early summer nailhead spot was very common, being found in greater or less quantities in many cars. It was also found in a car of Arizona tomatoes, affecting from 5-6% of the fruit; in one car of Texas tomatoes spotting 2% of the fruit; and in 4 cars of Mexican tomatoes injuring 3-5%, 4-6%, 8-10%, and 8-10% respectively.

The abundance of spot in Florida tomatoes is worthy of attention and is hence presented in more detail in the following table:

Table I. Percentages of nailhead spot found in carloads of Florida tomatoes shipped to northern markets from February to May, 1920.

Date	Markets	Number of cars	Percentage affected tomatoes
Feb. 14	Pittsburgh	1	8-10
" 24	Pittsburgh	1	6
" 25 - Mar. 2	Pittsburgh, Fort Worth, Cleveland	3	5-7
			17
			5-8
Mar. 2-25	New Orleans, Pittsburgh, Chicago	9	2-3
			18
			3-5
			6-8
			8-10
			6-8
			10-35
			12-15
			15-18
Mar. 4-6.	Pittsburgh	1	8-10
Mar. 4-27	Baltimore, Chicago, Pittsburgh	7	5
			13
			8
			2
			10-12
			12-15
			6-8
Mar. 9-18	New York, Boston, Chicago	4	5
			2
			8-10
			18
Mar. 9-25	Pittsburgh, Philadelphia, Boston	7	8-10
	New York		30
			3
			3-10
			5
			3
			5
Mar. 11-15	Philadelphia, Pittsburgh	3	10
			3
			14-16
Mar. 16-25	Boston, New Orleans, Pittsburgh,	7	3
	Chicago, Cleveland		10
			3-4
			8
			8-10
			3-5
			5-6
Mar. 19-27	Philadelphia, Cleveland, Kansas	3	10
	City		12-15
			30

Date	Markets	Number of cars	Percentage affected tomatoes
Mar. 20-23	Washington, Cleveland, Cincinnati	3	5-10
			10-12
			t
Mar. 22 - Apr.1	Pittsburgh	3	1
			2
			8-10
Mar. 25 - Apr.1	Chicago, Pittsburgh	4	20-25
			12-15
			10-15
			5
Mar. 30-31	Washington	2	2
			2
Mar. 31	Chicago	1	6-8
Apr. 6-8	Cincinnati, Detroit	3	8-10
			4-6
			2-3
Apr. 8	Chicago	1	10-15
Apr. 19-22	Cincinnati, Washington	7	18-20
			10-12
			4-6
			10-12
			15-17
			2
			18-20
Apr. 22-27	New Orleans, Pittsburgh, St. Louis	5	4-6
			10-20
			2
			10-12
			10-12
Apr. 29 - May 5	Washington, New Orleans	3	90
			25
			25-50
May 7	Philadelphia	1	35-60
May 13-15	Detroit, Philadelphia, New Orleans	5	10-15
	Cleveland, Baltimore		40
			30-35
			10
			20
May 15-19	Boston, Cleveland, Pittsburgh	6	20
			4
			25-65
			15
			25
			50-65
May 20-26	Detroit, Chicago	2	8-10
			5-10

Bacterial blight caused by Bacterium solanacearum.

Reports from Alabama, Georgia, Mississippi indicate this disease to be of comparatively little consequence this year. At least only a very few reports of the disease have been received in these states.

Phoma rot caused by Phoma destructiva.

This fruit rot has been reported to the Plant Disease Survey this year only by the market inspection service of the Bureau of Markets. Inspectors engaged in examining carlot shipments of tomatoes in some of the larger city markets have reported finding this disease this season in fruit shipped from Arizona, California, Florida, Texas, Cuba, and Mexico. The disease was found most frequently in shipments from Florida and Mexico. In cars from the other states the disease occurred in the following percentages: Arizona (2 cars, 1 and 4%), California (3 cars, 3-5%, 5-10%, and 15-18%), Texas (1 car, 22%, including slight Rhizopus rots as well as Phoma), Cuba (7 cars, 8-10%, 7-9%, 6%, 3-5%, 35-40%, 14%, and 10-15%). In a few cases it is mentioned that the Phoma rot is associated with decay caused by Rhizopus.

As the disease is a very important one in Florida tomatoes the percentages of decay found are presented in some detail in the following table. In many cases this rot was associated with soil rot caused by Rhizoctonia and soft rot caused by Rhizopus. Because of this it is very difficult for market inspectors to say definitely how much of the decay was due to the various causes.

Table 2. Percentage of Phoma rot of tomatoes by months as found by inspectors of the Bureau of Markets in carlots examined at larger city markets January 22 to June 14, 1920. (In some cases the rot was associated with other rots, particularly those caused by Rhizopus and Rhizoctonia. This is indicated in the table where such was the case.)

Percentages in					
January	February	March	April	May	June
35	4	10	8	15	15(P+R+F+Ba)
35	20-30	2(P+R)	3	9	
8	35-40	5-10(P+R)	25	34	9
2-3	30	2-3(P+R+S)	12	5-50	30-35(P+S+F)
5-6	10(P+R)		20	15	
15(P+S)	t	2	15-20	7	20-25(P+F+Ba)
	12	2	18-22	20-35(P+S+BlE)	
	27-30	3-5	15		
	6	4	35	3(P+S)	
	10	18-20	30-60	10(P+R+Bu)	
	5-7	25-30	20-50		
	10-15	28-30	10-12	20(P+R+F)	
	10-12	5-7	5-15(P+R)		
	5-10	30-35	20-30(P+R)	6-7	
	5	5	10-20(P+R)	7	
	3	20-25	14-18(P+R)	10	
	16-18(P+R)	10	27	12	

Percentages in

February	March	April	May
10	5	10	12-15(P+S+R)	15-25(P+A+R)	12-30
14(P+S)	3	8	18	R)	25-40
15-25	10-20	5-8	6	20-40(P+A+R)	7-13(P+S)
3-5	25	5	20-25	R)	10-12(P+F+Ba)
55	3	10	25-35	25-50(P+A+R)	
5-10	30(P+R)	20-25	2-15	R)	
10-12	25-35	20-25	5	30	
4	20	18-20	40	12-15	
2-4	2(P+S)	25-30	20-25	5	
5	10-20(P+S)	5	8	10	
	10(P+S)	20	5	2-3	
	3-6(P+S)	30	5	25	
	12(P+S)	50	10	5-8	
	6-8(P+S)	24	6-10	40	
	8-10(P+S)	4-8	15-20	10	
	20(P+S)	3	20-30	3	
	5	85	70-90	2-4	
	5	10-12	7-10	20	
	8-10	55-60	10	10	
	45-55(P+R)	16-18	18	3	
	35	5-10	12-15	12-14	
	17-21	50-60	40	6-8	
	4	2	15-30(P+S)	6-7	
	6-7	9	6(P+S)	14-15	
	2	2	2-5(P+R)	17-22	
	5-7	6-8	2(P+R)	15-30(P+R)	
	20-22	12-14	75-80(P+R)	25-45(P+R)	
	7	8	10(P+R)	4-8(P+R)	
	4(P+A)	10-30	25-30(P+R+Ba)	4-6	
	5(P+A)	12	12-15(P+R+Ba)	3-5	
	45-55	6-8(P+R)	28	7-8	
	20-25	10(P+R)	12-14	30	
	45-50	8-10(P+R)	15	45	
	40	10-12(P+R)	35-45	3-6	
	2-4	3(P+R)	20	30-35	
	75-90	5-8(P+R)	10-12	3-5	
	8-20	25-30(P+R+S)	12-15	13(P+R+BM)	
	10-25		15-20		
	4-5	75-90(P+R+S)	15	9-10	
	8(P+R)		10-12(P+R)	12-14	
	20(P+R)	10-15(P+R+S)	50(P+R)	24	
	15(P+R)		25-30(P+R+Ba)	40-45	
	15(P+R)	6-10	10-15(P+S)	20-30(P+R)	
	35-50(P+A)	20-35	10-25(P+R+S)		
	20-50(P+A)	20	5-6		
	25-30(P+S)	6-7	2		
	10(P+R+S)	17-20(P+An)	18		
		40(P+S)	75-85		
	35(P+R+An)	35-40(P+S)	45-50		
		35(P+S+R)	15(P+R)		
	8		2-3 (P+R)		

Percentage of					
February	- March -			April	May
	30-35	6	5-10		
	5	12	2		
	10-12	22(P+R)	65		
	20-25	6(P+R)	17		
	20	16-18(P+R)	4		
	27	4(P+R)	5-10		
	34	3-5(P+S)	10-15		
	10-15	25-50(P+A+R)	10		
	10-12	16-17	7-8		
	8	6-7	12-15		
	9	5			

P = Phoma rot
R = Rhizopus rot
S = Soil rot (Rhizoctonia)
F = Fusarium rot
A = Alternaria
An = Anthracnose
B_c = Bacterial rot
BlE = Blossom End rot
Bu = Buckeye rot
BM = Blue mold rot

Soil rot caused by Phizoctonia sp.

This has been one of the common rots of tomatoes in transit this season. It has been found by market inspectors in cars of tomatoes from Arizona, Florida, Texas, Cuba, and Mexico. Forty-eight cars of Florida tomatoes were found to contain more or less of rot, in some cases running to very high percentages. In a majority of instances it was associated with decays of other kinds.

In Mexican tomatoes the disease was very common. Dr. G. K. K. Link, who observed Mexican tomatoes in California, reported as follows in March, 1920:

> "Mexican tomatoes observed on the Los Angeles, Calexico, and Mexicali markets were of very poor quality. Most of the losses in tomatoes in transit to Los Angeles were due to soil rot (Rhizoctonia). Many of the affected fruits showed the primary lesions with concentric rings of alternating light and dark brown color, much better than I have ever seen them in Florida tomatoes on the market."

The severity of soil rot in shipments of tomatoes grown in Mexico is shown in the accompanying table.

Table 3. Percentage of soil rot found in Mexican tomatoes by inspectors of the Bureau of Markets, January to May, 1920.

Date	Percentage of decay	Cause of decay		
		Rhizoctonia	Rhizopus	Phoma
Jan. 22	12-15	x		
Feb. 14-20	5-15	x		
	16	x		
	15-25	x		x

Date	Percentage of decay	Cause of decay		
		Rhizoctonia	Rhizopus	Phoma
Feb. 27-28	10	x		
	25	x	x	x
Mch. 1-2	1-2	x		
	2-5	x		
	6-8	x		
Mch. 4-6	3-5	x		
	10-15	x	x	
Feb. 29	5	x		
Mch. 5-10	15-25	x		
	3-4	x		
	15-25	x		x
	5-15	x		x
Mch. 10-13	8-10	x		
	2-4	x		
	3-5	x		
	4-8	x		x
	3-5	x		x
	4-8	x		x
	6-8	x		x
	4-6	x		x
	10-15	x		x
Mch. 13-19	8-10	x		
	2-4	x		x
	5-8	x		x
	15-20	x		x
	4-6	x		x
	8-10	x		x
Mch. 19-22	2	x		
	4-8	x		
	10-12	x		x
	3-5	x	x	
Mch. 19-22	12	x	x	
	5-8	x		x
	2-4	x	x	x
Mch. 30-19	2-3	x		
	10	x	x	
	3	x	x	
	25	x	x	
	5	x	x	
	10-12	x		x
	10-15	x		
Apr. 12	2	x		x
Apr. 14	4-8	x		
	3-5	x		
May 10-14	20-25	x		x
	15-20	x	x	

Blossom end rot (non-parasitic)

According to J. A. McClintock, this trouble is very prevalent to date in Georgia, largely on account of dry weather during the past month. The disease is also showing up to some extent on tomatoes in suburban gardens in the District of Columbia.

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